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A leap in reform or leap of faith?

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NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS

**FIXED-PRICE, VARIABLE OUTCOME CONTRACT TYPE:
A LEAP IN REFORM OR LEAP OF FAITH?**

by

Thomas S. Armstrong

June 2002

Thesis Advisor:
Associate Advisor:

E. Cory Yoder
David V. Lamm

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13. ABSTRACT (maximum 200 words) <p>The Under Secretary of Defense for Acquisition, Technology and Logistics commissioned a group to study price-based acquisition in 1998. The Price-based Acquisition (PBA) Study Group reported out in November 1999. One report recommendation was to create and use a new contract type. The report states, "We have concluded that there is a place for a new contracting approach and contract type, Fixed-price, Variable Outcome. This approach is particularly applicable to and will allow many high-risk Science and Technology (S&T), risk reduction, and service contracts to be firm-fixed-price." The focus of this thesis is to analyze the concept behind FPVO, compare the FPVO to other existing contracting types, explore the most beneficial applications of the FPVO and finally to make recommendations based upon the data and analysis.</p> <p>The major conclusion is that the FPVO is an inappropriate contract type to use for any acquisition. The FPVO increases risk primarily as a result of placing control of the outcome in the hands of the contractor. The major recommendations are to either abandon the FPVO concept or develop a better vehicle to apportion risk. Two alternatives are suggested.</p> <p>Acquisition Reform; Fixed-price Variable Outcome; Contracting</p>				
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**FIXED-PRICE, VARIABLE OUTCOME CONTRACT TYPE:
A LEAP IN REFORM OR LEAP OF FAITH?**

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Lieutenant Commander, United States Navy
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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

**NAVAL POSTGRADUATE SCHOOL
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ABSTRACT

The Under Secretary of Defense for Acquisition, Technology and Logistics commissioned a group to study price-based acquisition in 1998 in a continuing effort to reform the Government acquisition process. Acquisition reform is intended in part to encourage traditionally non-Department of Defense contractors to participate in Department of Defense acquisitions. The Price-based Acquisition (PBA) Study Group reported out in November 1999. The report defined price-based acquisition and made recommendations to implement PBA. One of those recommendations was to create and use a new contract type. The report states, “We have concluded that there is a place for a new contracting approach and contract type, Fixed-price, Variable Outcome. This approach is particularly applicable to and will allow many high-risk Science and Technology (S&T), risk reduction, and service contracts to be firm-fixed-price.”

The focus of this thesis is to analyze the concept behind the Fixed-price, Variable Outcome (FPVO) contract type, compare the FPVO to other existing contract types, explore the most beneficial applications of the FPVO and finally make recommendations based upon the data and analysis.

The major conclusions of this thesis are that the FPVO is an inappropriate contract type to be used in any Department of Defense acquisition and the basic objectives of the FPVO concept are still valid and worth pursuing. The FPVO contract type greatly increases risk of an acquisition due to the fact the contractor has control over the final outcome. Increasing industry participation, emulating best commercial practices, reducing risk for all parties concerned and achieving best value should continue to be the aims of acquisition reform. The major recommendations are to abandon further discussion and effort to implement the FPVO contract type as presented in the PBA report and develop a new contract vehicle that is better able to apportion risk without relinquishing Government control over the outcome. Two alternatives are suggested. One alternative increases the dollar threshold of the FP LOE contract type and adds milestone events. The other recommendation suggests building a contract type upon the CAIV philosophy.

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I. INTRODUCTION

A. PURPOSE

Acquisition professionals in both Government and industry agree Government acquisition, Department of Defense (DoD) acquisition in particular, needs improvement. Leaders in DoD acquisition have determined Government procurement processes and tools should mirror those found in commercial industry. Many recommendations have been made toward that end and pilot programs have been studied (Ref.18,19). Pilot program successes and failures are publicized in trade journals, reported in newspapers and discussed at length in graduate theses. The institutionalization of reforms is often not a criterion for success, therefore many reform initiatives never make the leap from success at a "center of excellence" to common practice throughout the acquisition community.

The purpose of this thesis is to analyze one reform recommendation designed to bring DoD acquisition procedures in concert with commercial practices. This thesis will draw sound conclusions for the recommendation studied and offer recommendations to further stimulate and encourage defense acquisition reform.

This thesis has drawn upon the knowledge and experience of top acquisition policy makers and practitioners. It builds upon their efforts to reform defense acquisition to encourage broader industry participation in DoD contracts while striving to obtain best value.

B. BACKGROUND

The broad area of research is acquisition reform. Acquisition reform has been on the minds of acquisition professionals, Congress and the executive branch for roughly two decades. Considerable time and resources have been devoted to acquisition reform with mixed results. Several initiatives and policy course corrections have been generated by acquisition reform such as the Defense Acquisition Workforce Improvement Act (DAWIA) of 1990, the Federal Acquisition Streamlining Act (FASA) of 1994 and the Federal Acquisition Reform Act (FARA) of 1996. These Acts resulted in changes to the Federal Acquisition Regulation (FAR) and altered the applicability of both the Truth in Negotiation Act (TINA) and the Cost Accounting Standards (CAS).

The regulatory changes also caused acquisition professionals to re-think the acquisition process. For many years there was a tendency to apply the firm-fixed-price (FFP) contract type to most situations, regardless of whether or not it was the best type. This cookie-cutter approach to contracting was replaced by the generic dictum of using FFP for low-risk acquisitions and cost-reimbursement (CR) contract vehicles for high-risk acquisitions. As the spotlight on the acquisition community spurred discussion and debate on re-engineering the acquisition process to comply with the Acts, the focus shifted from eking out the lowest cost to obtaining the best value.

In the interest of obtaining best value, several initiatives were introduced. The source of the initiatives was commercial industry. Government procurement officials

devoted to acquisition reform determined the best practices to emulate were those used in the commercial marketplace (Ref.18). This conclusion makes sense in that the commercial marketplace is subject to intense competitive pressure and market forces. In a Darwinian sense, only the strongest companies (those with the most efficient procurement, production, development, etc.) will survive. Acquisition reformers understandably looked to the procurement strategies and practices found in successful corporations for ideas to improve Government acquisition. Some of the initiatives generated to synergize with commercial best practices included abandonment of the strict compliance with military specifications (MILSPECS), performance (outcome) -based contracting, and price-based acquisition (PBA)(Ref.19).

Price-based acquisition is designed to correct several shortcomings of the traditional acquisition process (Ref.23, p.ES-4). Foremost, PBA envisioned Government acquisition procedures to be more commercial-like. Through observation, surveys and research the defense acquisition community determined leading firms in a variety of sectors refused to participate in DoD contracts due to the overbearing and overwhelming laws, standards and regulations that went with such participation (Ref.19, PPCG charter). The Government's own procedures were entrance barriers. These barriers effectively decreased competition, reduced the size of the defense industrial base and ultimately increased cost of procurement. By aligning DoD acquisition policies and procedures with best commercial practices, the Government sought to remove the barriers

preventing a broader number of firms from competing for defense contracts and drive down the cost of procurement.

Implicit in the desire to remove barriers to entry is the desire to reduce administrative burden and Government oversight of contractors. PBA and other acquisition reform initiatives seek to disengage the Government from the contractors (e.g. limit auditors, in-plant representatives and administrative support personnel) while at the same time maintaining risk at an acceptable level (Ref.23, p.ES-3). The difficulty of acquisition reformers then is to find a mechanism to motivate contractors to participate in defense acquisition, incentivize them to perform, mitigate risk and accomplish all of this *without* excessive oversight.

In October 1998, the Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)), Dr. Jacques Gansler, commissioned a group to study PBA and make recommendations as to its use and effectiveness (Ref.20). Specifically the group's charter was to:

- a. Analyze the implementation of PBA in the Department of Defense (DoD)
- b. Identify specific tools and techniques to facilitate greater use of PBA within the Department, and
- c. Identify what actions will be required to transform the Department's buying practices into ones that are more commercial-like (Ref.23, p. ES-3)

The Price-based Acquisition Study Group reported its findings in the PBA Study Group Report of 15 November 1999 (Ref.23). The Group defined PBA and made many recommendations as to its use and effectiveness in DoD

contracting. The recommendations included evolutionary and incremental contracting methods, renewed interest in market research, value engineering and source selection strategies. The Report also included a recommendation to create and use a new contract type, the Fixed-price, Variable Outcome (FPVO) contract (Ref.23, p.ES-9).

The Fixed-price, Variable Outcome contract type, as touted in the PBA report, was designed to emulate the common practices of private industry, satisfying the third element of the group's charter. The FPVO contract type was recommended as the preferred approach for all Science and Technology (S&T) and risk-reduction contracts (Ref.23, p. 71).

C. OBJECTIVES

This thesis examines the impetus behind the recommendation to create a new contract type. The research also examines the perceptions and attitudes of leaders in the acquisition profession to discover their thoughts on the FPVO contract type. The research defines the FPVO contract type and compares the FPVO's ability to reduce risk and garner best value when compared to other existing contract types. The researcher also examines the conditions for use of the FPVO and acquisition situations in which the FPVO is the optimal contract type to use.

D. RESEARCH QUESTIONS

The primary research question is: How might the Fixed-price, Variable Outcome contract type be effectively used in the process of acquiring goods and services for the Department of Defense? The subsidiary questions are as follows:

1. What is the FPVO contract type?
2. How is the FPVO contract the same, similar and/or different from the following:
 - a. Firm-fixed-price contracts
 - b. Firm-fixed-price, Level Of Effort contracts
 - c. Cost Reimbursement contracts
 - d. Time and Materials contracts
 - e. Cost as an Independent Variable (CAIV)
3. What are the prime applications for the FPVO in DoD acquisition?
4. What are the conditions necessary for its use?
5. What specific recommendations can be made to foster implementation and use?

E. SCOPE, LIMITATIONS AND ASSUMPTIONS

This thesis focuses on creating a working definition for the Fixed-price, Variable Outcome contract type and determining whether or not there exists a genuine need or desire for this new contract vehicle. In this introductory chapter, the thesis provides relevant background information, states the research objectives and specific questions, and reviews the research methodology.

This thesis discusses the presence of risk in all contracts and the need to mitigate that risk in Chapter II. The FPVO contract is defined for the reader in Chapter II and the motives behind the recommendation are discussed. This thesis then compares the FPVO contract type concept to existing contract types, noting the differences and similarities of the types mentioned. This effort then introduces the reader to the Cost as an Independent Variable (CAIV) decision process.

In Chapter III this thesis states the information obtained in the research phase of the thesis process. To ensure quality input was obtained, the researcher targeted leaders in both the Government and civilian acquisition communities.

Chapter IV will break down the data presented in Chapter III and apply the data to the issues at hand. The researcher analyzes and frames the data to answer the primary and secondary research questions.

Finally in Chapter V this thesis provides sound conclusions and recommendations based upon the data and analysis.

This thesis does not focus on the ability of the FPVO contract to replace existing contract types. Potential protests are not specifically explored due to the tangential and speculative nature of this aspect. This thesis does not study past successes/failures of the FPVO approach, as there are no good examples of the FPVO contract's use in its form as stated in the PBA report.

The one significant limitation is the lack of information. Since this contract type was first recommended

by the PBA Team in 1999, very little has been published on the FPVO. Feasibility studies have not been conducted on the contract type nor have acquisition academics researched or studied this option. As a result of this limitation, the research is largely subjective, though the subjectivity has been tempered by obtaining as many inputs as practicable.

The researcher assumes the reader has an interest and basic understanding of the acquisition process. Further, the researcher assumes the reader is familiar with acquisition reform initiatives and terminology. The researcher finally assumes the reader understands human nature in that humans, particularly those whose actions are heavily regulated and processes institutionalized, are resistant to change.

F. LITERATURE REVIEW AND METHODOLOGY

As the FPVO contract is still in the concept stage and no definitive field deployment information exists, the literature available on this topic is scant. To overcome the shortfall of written information, the researcher queried individuals at the top of the acquisition community. Leaders and policymakers in both Government and commercial sectors were contacted and provided valuable input. The participants came from the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)), Lockheed Martin Corporation, Northrop-Grumman Ship Systems, Raytheon and the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology.

In addition to questionnaires and personal interviews, the researcher utilized the information found in the Price-based Acquisition Study Group Report, memoranda on the

subject of acquisition reform and price-based acquisition issued by the USD(AT&L), and other miscellaneous electronic resources. The researcher also used the Federal Acquisition Regulation in the comparison of the FPVO contract to existing contracting types and drew knowledge and information from the Contract Pricing Reference Guide (Refs.5,6).

G. BENEFITS OF RESEARCH

This research effort will provide the necessary information for acquisition reformers and Government acquisition policy-makers to conclusively determine whether the FPVO contract should be tested and implemented across the procurement agencies or whether it is an idea that requires no further thought or decision. At present, a gulf exists between what decision makers know about the FPVO contract and what they need to know to make an informed decision. This effort will fill the gulf and either give acquisition professionals a useful tool to reduce risk and obtain best value or recommend reformers continue the search for more effective commercial-like procurement methods.

H. ORGANIZATION OF STUDY

This research is organized in the following way: Chapter I introduces the reader to the topic by providing background information. Chapter I also states the objectives of the researcher and the research questions. Chapter II provides background on the contracting process, risk mitigation, and existing contracting tools. Chapter II provides a definition of the FPVO contract type and compares the FPVO contract to existing contracting vehicles. Chapter III introduces the research participants

and presents the research data collected. Chapter IV provides the researcher's own analysis of the data. Chapter V states specifically the researcher's conclusions and recommendations.

I. CONCLUSION

This concludes the introductory chapter. Chapter II provides the reader with background information necessary to place the thesis in proper context. Chapter II also defines the Fixed-price, Variable Outcome contract type and permits the reader to conduct a head-to-head comparison of the FPVO contract and existing contract types.

II. BACKGROUND, DEFINITION AND COMPARISON

A. INTRODUCTION

There is constant pressure to reform, revolutionize and improve the Department of Defense (DoD) acquisition process. To many, there is the general perception the DoD acquisition system is "broken" (Ref.3) and radical changes are needed to fix the system. This general perception persists in part due to the billions of dollars DoD spends each year and the Congressional microscope under which the acquisition professionals must carry out their duties (Ref.26).

Military and civilian leaders look to those who know the system best to bring about change within the system. Blue-ribbon panels and study groups are routinely established to generate the ideas that will bring about a revolution.

B. BACKGROUND

To fully understand the FPVO contract type the reader must be knowledgeable about the concept and omnipresence of contract risk. Risk is the probability things will not occur as planned. In the field of Government contracting, the existence of risk means the design might not be ready when promised, cost limitations may be exceeded, or the item being acquired may not perform as needed or desired. The three main types of risk for the Government are schedule, cost and performance (Ref.5). The contractor runs risk as well when dealing with the Government. Contractors must be concerned with the availability of Government funds (as approved by Congress), the contractor's ability to acquire raw materials and generation of revenue.

Risk is not a case of black and white. There are innumerable shades of gray. The Government and the contractor must therefore find ways to limit or mitigate their respective risks. One of the primary means of mitigating risk is through contract type selection (Ref.10, p.1). The contract type agreed to by the Government and the contractor is the starting point for mitigating and sharing the risk so that the degree of risk is acceptable to both parties.

Traditionally the Government has favored the firm-fixed-price (FFP) contract type due to its ability to assign the majority of risk to the contractor (Ref.26). Under a FFP contract, the contractor absorbs cost overruns. The contractor is therefore incentivized to control costs. Additionally, under an FFP agreement, the contractor must deliver the goods or services for which contracted. The FFP has other advantages for the Government. The FFP generally entails the least administrative burden when compared to other contract types and therefore contracts can be let more quickly. Using the FFP contract type may negate the need for contractor's to demonstrate compliance with Cost Accounting Standards (CAS)(Ref.5).

The traditionally preferred approach is not always the best approach. Contractors must consider their own bottom lines when entering into a contract. It is not always in the best self-interest of the contractor to assume the lion's share of risk. At the opposite end of the spectrum from FFP is the Cost-Reimbursement (CR) contract type. Under a CR arrangement, the Government reimburses the contractor for all *allowable* and *allocable* costs reasonably incurred in the performance of the contract (Ref.6, p.337).

Under a CR contract the contractor's cost accounting system must be CAS compliant for contracts over \$500,000 (modified CAS applies) and may be subject to Government audit (Ref.6, p.623). While cost targets and share ratios exist in CR contracts, the contractor is potentially not as incentivized to control costs as he is under a FFP contract, increasing the degree of cost risk borne by the Government (Ref.26). The CR agreement requires the contract to put forth their 'best effort' rather than a requirement to deliver the goods or services for which contracted (Ref.5).

Between the FP and CR contract types there are variations of each contract vehicle to manipulate and apportion the degree of risk between contracting parties. Guidance provided in the Federal Acquisition Regulation (FAR) directs contracting professionals to use a FP type contract when the outcome can be well-defined and cost can be reasonably estimated so as to determine a fair and reasonable price (Ref.6, p.333). The FAR directs contracting professionals to apply a CR type contract when the outcome cannot be reasonably well-defined and a degree of final cost uncertainty exists (Ref.6, p.337). The FAR provides this guidance and contract type gradations to provide contracting professionals with the ability to make a contract type choice that has the highest possibility of success.

DoD acquisition reformers are continually looking for innovative approaches to contracting to further mitigate risk, encourage a larger number of commercial firms to vie for Government business by imitating commercial practices and break down the barriers that continue to shrink the

defense industrial base. Price-based acquisition (PBA) is an approach that is making strides toward accomplishing all of these goals. Price-based acquisition promises to reduce Government cost risk by relying on market research, competition, asymmetric pricing, etc., while continuing to place importance on best value (Ref.23, ES). Price-based acquisition, properly implemented, has the added benefit of conforming DoD practices to commercial industry practices, thereby tearing down barriers and encouraging broader commercial participation (Ref.23, ES). To achieve these objectives the PBA Study Group Report of 1999 recommended a new contract type be added to the contracts tool bag to recognize and apportion risk in the same way as commercial industry.

In particular, we believe there are major steps DoD can take to reduce risk associated with acquisitions by aligning DoD practices more closely with the commercial world. For example, within DoD, the level of perceived risk associated with procurements significantly affects the determination of contract type. In contrast, contract type in the commercial sector is a given, firm-fixed-price for most acquisitions. Is this because the commercial sector does not buy high-risk products? We think not. The commercial sector structures their purchases to use fixed-price contracting and price-based acquisition. DoD can take a similar approach. How can DoD increase the use of firm-fixed-price contracts, even for major system research and development efforts, without placing undue risk on suppliers? By doing what a commercial firm does - structuring the work and using an overall acquisition approach designed to lower risk (Ref.23, p.ES-4).

The PBA Study Group recommended a departure from institutionalized processes that have become a part of the DoD acquisition culture. The old paradigm of FP contracts

for lower risk procurements and CR type contracts for higher risk procurements was challenged. The PBA Study Group determined a need for the Fixed-price, Variable Outcome (FPVO) contract type. The need arose from a desire to mirror commercial practices and reduce Government risk for "high-risk Science and Technology (S&T), risk reduction, and service contracts (Ref.23, p.ES-8)." The specific recommendation appeared as follows:

We recommend USD(AT&L) issue a DoD-wide policy making Fixed-price, Variable Outcome the preferred approach for all S&T and risk reduction contracts (e.g., Preliminary Design and Risk Reduction) and other contracts where a range of plausible outcomes is possible and acceptable.

C. THE FIXED-PRICE, VARIABLE OUTCOME CONTRACT TYPE

1. Impetus

So what exactly is this new contract type? Before tackling that question, let us examine the reasons behind the recommendation. Mr. Terry Little, a member of the PBA Study Group, provided four main reasons for the FPVO contract recommendation.

1. Many commercial companies decline to do Research and Development (R&D) business with DoD because of our penchant for cost reimbursement contracts. Such contracts demand certain accounting standards and many companies understandably resent the intrusion into their business. In today's environment we really need the R&D capabilities these companies have.
2. Second reason is the infrastructure that comes with cost reimbursement contracts—

auditors, checkers, etc. It's an unnecessary cost for the Government that we pay both directly and indirectly through overhead on contracts.

3. Much R&D work the Government does should really be a fixed-pricing arrangement—one where there are incremental investment decisions to evaluate progress and decide whether or not to invest additional money or cut the losses and move on to other projects.
4. Finally, budget realities often force us to limit the monies we can spend. When we are tightly budget constrained, but use cost reimbursement contracts we are just being dishonest with our contractors and ourselves (Ref.15).

As you can see from Mr. Little's comments, the main impetus behind the recommendation was to foster competition and encourage industry participation by removing barriers, reduce Government infrastructure, impose an incremental approach on R&D contracting and force DoD to live within its own budget.

2. Fixed-price, Variable Outcome Defined

The Fixed-price, Variable Outcome contract type establishes a firm-fixed-price for a product or service that cannot be well-defined or is chosen not to be well-defined. The requiring activity generates a range of outcomes that are both plausible and acceptable to *them*. The contractor puts forth its best effort to deliver a product or service within the defined range but if unsuccessful for whatever reason (barring criminal

activity) still receives 100% of the fixed-price. It is important to note the contractor determines the outcome under the FPVO contract based upon funding and the range established (researcher's own definition).

To further clarify, the FPVO contract is dependent upon a decision maker or decision process to determine the value of the acquisition (Ref.23, p.71). The amount of payment to the contractor is fixed. The outcome ideally should be within a range of plausible outcomes as defined by the requiring activity. The FPVO contract does not define a specific objective or outcome nor does it require the contractor to deliver. "The degree of success does not determine payment, full payment occurs whether the effort succeeds 110% or 0% (Ref.15)." "The FPVO concept presumes that, within the total amount of funds available, what the contractor actually does is a 'best effort' geared toward achieving a mutually agreeable goal (Ref.23, p.72)." The PBA report provides the following illustration.

Imagine that you have an aging automobile with several mechanical problems. Your goal is to get as many of the problems fixed as possible, but you only have \$500 to spend on repairs. You know that this is not enough to fix everything. You go to a mechanic and describe the symptoms of the problems. You also tell the mechanic you have a \$500 limit. You tell him that you may come back and fix the remainder of the problems when you have more money to spend provided that you are satisfied with what he has done (Ref.23, p.72).

Not reflected in the illustration is the objective of imposing an incremental approach. Mr. Little expounded on this aspect as follows: "Once he (the car owner) sees the result he may decide to a) invest no more money in the car and live with it like it is, b) invest another increment of

money, or; c) sell the car (Ref.15)." The PBA report provided two additional examples shown in Appendix B (Ref.23, pp.M-1, M-2).

It should be noted the requirement to pay the contractor the full amount regardless of the success of the outcome adds the firm-fixed-price element to the FPVO contract. A descriptively accurate name for the proposed contract type, based upon the wording of the PBA report and supplemental information obtained, is the Firm-fixed-price, Variable Outcome (FFPVO) contract. While FFPVO is more descriptively accurate, this thesis will maintain the conventional FPVO acronym established in the PBA report.

D. COMPARISON OF FPVO CONTRACT AND OTHER CONTRACT TYPES

The FPVO contract is a type of FP contract. The recommended applications of the FPVO contract are "for fixed-price purchases of engineering services, maintenance, studies, research, risk reduction, and other activities where the procurement is essentially an investment and results other than a well-defined end product are acceptable (Ref.23, p.71)." The inclusion of "risk reduction" broadens the recommendation to apply to virtually every contract in which the parties attempt to reduce or mitigate their own risk. The recommendation to create an entirely new contract type begs the question "What will a FPVO contract give me that I did not have before?" At this point a comparison of the FPVO contract with existing contract types is appropriate (An at-a-glance comparison is offered in Appendix E.).

1. FPVO Compared to FFP

Firm-fixed-price contracts establish a single price for the goods or services being procured that are not

subject to adjustment based upon actual costs experienced by the contractor (Ref.6, p.333). As stated previously, the contractor bears the preponderance of cost, schedule and performance risk under an FFP arrangement. The FFP contract type maximizes the contractor's incentive to control costs. Under an FFP arrangement, every dollar the contractor saves is an additional dollar of profit (Ref.13).

The FFP contract type is typically used to acquire commercial goods and services when the outcome is reasonably defined and/or definitive functional or detailed specifications exist (Ref.6, p.333). As with all contracts, the contracting officer must be able to establish a fair and reasonable price to apply a FFP contract.

The FFP contract requires the contractor to deliver the supplies or services for which contracted. The administrative burden to the Government is the lowest under a pure FFP arrangement. The FFP, as described in the FAR, is not for use in high-risk R&D contracts (Ref.6, p.333).

Like the pure FFP contract type, the FPVO contract also establishes a single price (non-adjustable) for the goods or services for which contracted. Again, like the FFP contract the FPVO contract may be used for commercial items, such as aircraft engine repair, but it may also apply to non-commercial R&D efforts. Unlike FFP contracts, the contractor does not assume the majority of risk in an FPVO arrangement. Relieving the requirement on the contractor to deliver an outcome and allowing the contractor to determine the outcome alters the risk equation, bringing more risk on the side of Government.

The FPVO contract does not require the outcome to comply with strict specifications nor does it require the outcome be reasonably defined up front (Ref.23, p.71). The FPVO contract does call for establishment of a range of outcomes that are both plausible and acceptable. This range of outcomes serves as a target or boundary for the contractor's efforts. As stated in the FPVO contract definition section, the contractor is not required to furnish an outcome within the range of outcomes but is required to give its best effort. The contractor can receive full payment under a FPVO contract even though its best effort was unsuccessful. This is in sharp contrast to the FFP contract where the contractor is paid only upon delivery.

2. FPVO Compared to Fixed-price, Level Of Effort (FP LOE)

The FPVO has many more similarities with the FP LOE than with the FFP. The FP LOE contract type requires the contractor to "provide a specified level of effort, over a stated period of time" (Ref.6, p.337) on work that is not well-defined. As it is still in the FFP family, the dollar amount is established at the beginning of the relationship.

The FP LOE contract type is only applicable to R&D efforts and other efforts where a topic is being investigated with unknown outcomes (Ref.6, p.337). As with the FPVO, the contractor can receive full payment of the fixed amount regardless of whether or not the outcome is declared a success: the "payment is based on the effort expended rather than on the results achieved (Ref.6, p.337)." Due to this arrangement, the Government bears the burden of performance risk but tempers the cost risk by setting a dollar value limitation.

The FP LOE contract has strict limitations that constrain its applicability. Those limitations are:

- (a) The work required cannot otherwise be clearly defined (as with FPVO)
- (b) The required level of effort is identified and agreed upon in advance (in contrast with FPVO)
- (c) There is reasonable assurance that the intended result cannot be achieved by expending less than the stipulated effort; and
- (d) The contract price is \$100,000 or less, unless approved by the chief of the contracting office (Ref.6, p.337).

3. FPVO Compared to Cost-reimbursement Contracts

The primary tenet of CR contracts is the Government reimburses the contractor for all allowable and allocable costs reasonably incurred up to a cost ceiling. To be allowable the cost charged to the Government must meet CAS (if CAS applies) and to be allocable the contractor must be able to show the Government how and where the money was spent under specific accounting controls subject to CAS and Generally Accepted Accounting Principles (GAAP)(Ref.26). The CR contract type family may allow Government auditors to review company accounting systems, CAS compliance and closely monitor contractor performance, which may not be required under a fixed-price type contract.

The CR contracts are currently used when it is difficult or impossible to determine the cost of an acquisition at the time of contract (Ref.6, p.337). This condition most often occurs when the requirement cannot be clearly defined, just as with the FPVO contract. Under CR

contracts the Government holds the lion's share of all three risk categories, cost, schedule and performance. The contractor is required to put forth a best effort, just as with FPVO contract, and will receive some level of payment based upon that effort. In contrast to the FPVO contract, there is no stipulation the contractor receive the full amount for the effort, only that they receive all allowable and allocable costs.

In sharp contrast to FP contracts, CR contracts are *prohibited* from use in the acquisition of commercial items. Also in contrast is the contractor's incentive to control costs. Where the FP contract promotes and rewards efficiency, the CR contract type permits cost escalation provided costs are allowable and allocable.

The requirement in CR contracts for auditors, checkers and monitors increases the administrative burden for both the contractor and the Government over FP contract types. As noted above, an impetus behind the FPVO concept is to do away with such infrastructure.

Limitations of the CR contract type have been mentioned but will be listed below for clarity:

(a) A cost-reimbursement contract may be used only when-

(1) The contractor's accounting system is adequate for determining costs applicable to the contract; and

(2) Appropriate Government surveillance during performance will provide reasonable assurance that efficient methods and effective cost controls are used.

- (b) The use of cost-reimbursement contracts is prohibited for the acquisition of commercial items (Ref.6, p.337).

It should be noted that the FAR makes the important distinction that CR contracts should only be used when "uncertainties involved in contract performance do not permit costs to be estimated with sufficient accuracy to use *any type of fixed-price contract* (italics added)(Ref.6, p.337)." The FAR clearly shows a preference for fixed-price type contracts over CR type contracts.

4. FPVO Contracts Compared to Time and Materials (T&M) Contracts

The Time and Materials contract type is included in this section because of the crossover of both FP and CR contracts into the T&M area. The T&M contract type is used to acquire commercial goods or services and fixes an element of the final cost, such as hourly wage rate (Ref.6, p.351). The variable costs are most often the cost of material and material handling. The illustration used to explain the FPVO was that of a car in a mechanic's repair shop. If the reader has ever had an auto repaired, he or she will remember the mechanic worked at a fixed hourly rate and the material or parts required for the repair appeared as separate line items on the bill.

As with the FPVO, a ceiling, or "do not exceed" price is established at the time of the contract. Similar to the FPVO, under a T&M contract situation it is not possible to determine the duration of the effort or total cost. This uncertainty breeds risk. The risk in a T&M contract is primarily the Government's. The contractor is rewarded for costly parts and many labor hours as long as he remains

under the price ceiling. To mitigate this risk, the Government must expend resources to monitor the contractor.

Just as with the FPVO contract, the contractor under a T&M contract arrangement must exert his best effort in the performance of the contract. The contractor will receive payment based upon hours expended and materials used that are verifiable and under the price ceiling. There is no guarantee the contractor will receive the price-ceiling amount.

The T&M contract type has some strict limitations. It is clearly a type to use as a last resort. T&M may be used (Ref.6, p.351)

- (a) only after the contracting officer executes a determination and findings that no other contract type is suitable; and
- (b) only if the contract includes a ceiling price that the contractor exceeds at his own risk.

E. COST AS AN INDEPENDENT VARIABLE (CAIV)

The PBA report describes the FPVO strategy as a variant of Cost as an Independent Variable (CAIV) (Ref.23, p.72). CAIV is a decision process rather than a contract type and as of January 2001 has not been mentioned in the FAR. While CAIV has been widely written about and discussed, many of those involved in the daily work of acquisition are unfamiliar with both the term and the concept. CAIV has been defined as follows:

A multi-faceted management approach to planning for, designing, manufacturing and sustaining best value systems that meet warfighter needs (Ref.27).

Though many missed the proclamation, CAIV is a defense-wide policy (Ref.27). Conceptually, CAIV fixes costs and emphasizes trade-offs among performance characteristics of an acquisition (Ref.8).

CAIV allows an affordability evaluation to be made of the various supportability approaches and choices among reliability, maintainability and supportability options to reflect program objectives and thresholds (Ref.8).

For example, a new rifle is in development for DoD and the requiring activity desires a certain weight, muzzle velocity, reliability, and effective range. CAIV analysis is performed in the systems engineering process and the trade-off decisions become part of the requirements document. Both actual contractor performance and schedule are dependent upon the funds available (Ref.8). Under CAIV, those responsible for developing the requirements document maintain control of the outcome by making trade-off decisions prior to the source selection process. Best value does not mean highest cost; rather it means greatest capability and reliability for the money spent.

The CAIV approach is similar to the FPVO approach in that it looks to incrementalize the acquisition process and make decisions based on fixed resources. CAIV is again similar to FPVO in that it supports best value by requiring trade-offs. In FPVO, the trade-offs occur within the range of plausible and acceptable outcomes. In the CAIV philosophy, the range is not expressly stated but present just the same.

The differences between the two are fairly clear. CAIV is not a contract type but rather could be used in conjunction with a FP or CR type contract. CAIV is already

a defense-wide policy and has been used on high-level programs such as the Joint Direct Attack Munition (JDAM) and the Advanced Amphibious Assault Vehicle (AAAV)(Ref.27).

The CAIV philosophy emphasizes integrated teams much more so than does the FPVO recommendation (Refs.8,27). The FPVO contract is recommended primarily as a tool for contracting officers while CAIV is an acquisition strategy designed to foster ownership of cost, schedule and performance by every individual involved in the acquisition (Ref.27).

F. CONCLUSION

This chapter highlights the similarities and differences between the FPVO contract type and the contract vehicles already listed in the FAR. The FPVO contract draws upon key elements of FFP, FP LOE, CR and T&M contracts in an attempt to capitalize upon the strengths of each, while leaving the weaknesses of each behind. The aim of the FPVO contract type is to decrease cost risk to the Government by virtue of the fixed-price element while simultaneously reducing cost risk through an incremental strategy. Mr. Little of the PBA study Group stated FPVO "should replace cost reimbursement contracts for many applications (Ref.15)."

I have also introduced the CAIV philosophy to the reader to highlight the similarity between the FPVO as recommended and an existing defense-wide acquisition policy.

G. SUMMARY

Chapter II provides important background data for understanding the defense acquisition environment, in particular the risks involved, and for understanding the

genesis of the FPVO recommendation. Chapter II defines the FPVO contract for the reader, provides examples and highlights similarities and differences between the FPVO contract and other contract vehicles.

Chapter III introduces the research study participants to the reader and presents the information derived from their survey responses.

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III. PRESENTATION OF DATA

A. INTRODUCTION

This section introduces the research participants. To obtain the highest quality responses the researcher solicited information from people at the highest levels of defense acquisition. The five respondents answered questions formulated to determine: (1) the applicability of the FPVO concept; (2) the impact the FPVO contract might have on the risk equation if implemented, and; (3) what the FPVO concept does in the context of acquisition reform.

B. INTRODUCTION OF RESEARCH PARTICIPANTS

The research participants are:

Ms. Deidre Lee, Director, Defense Procurement, Office of the Under Secretary of Defense (Acquisition, Technology and Logistics)

Ms. Judith Blake, Senior Procurement Analyst, Headquarters Department of the Army, Office of the Assistant Secretary of the Army, Acquisition Logistics and Technology, Acquisition Reform Directorate

*Please note Ms. Blake's opinions are her own and not the official position of the U. S. Army

Eugene Harshbarger, RADM (Ret), USN, Director, Acquisition Policy, Northrop-Grumman Ship Systems

Mr. Richard Foley, Vice President - Contracts, Raytheon Company

Mr. Scott Parry, Corporate Director, Contract Policy, Lockheed Martin Corporation

C. PRESENTATION OF DATA

The section that follows is presented in the form of the questions asked and responses received. For simplicity, the following format will be used to indicate the participant providing the response: **(DL)** for Deidre Lee,

(JB) for Judith Blake, (EH) for RADM Harshbarger, (RF) for Richard Foley and (SP) for Scott Parry.

The researcher has presented the responses to the questions that are most relevant and added value to the research. A complete list of questions is provided in Appendix C. Some questions have been rephrased from their original form for clarity. The meaning and intent of the rephrased questions has been kept intact. The interview with Ms. Lee was conducted over the telephone. The researcher has added words to her responses for grammar and flow while attempting to the maintain integrity of her responses. All other interviews were conducted via electronic mail.

1. Do you think there is a genuine desire to move away from cost-reimbursement contract types whenever possible?

(DL) From a Government standpoint, yes. The desire is to appropriately manage risk. We must determine the best way to manage risk for the Government and the contractor.

(JB) On the part of leadership there is a very strong desire to move away from cost-reimbursement contracts. Contractors are, in my experience, more reluctant. Both fixed-price and cost contracts have their own set of problems in administration. It should be noted that the Inspector General and the General Accounting Office are somewhat conservative, and are moving toward an even greater conservatism. They are recently raising significant concerns about the

lack of certified cost and pricing data and using price analysis alone to determine price reasonableness. They feel that some price-based actions may not have considered fully the value equation such that the taxpayer is protected.

(EH) There has always been a desire to avoid cost-type contracts because of the uncertainty of required funding. This, however, should not be the driver for decision-making. If a fixed-price type contract is used where the work scope is not well-defined, the normal result is difficult contract administration and a high likelihood of claims and/or unsatisfactory performance.

(RF) Current budget limitations are in effect causing cost type contracts to be implemented as fixed; accordingly a move to fixed price is desirable. However, both contract deliverables and customer expectations must clearly be flexible goals.

(SP) No, I think there is a desire to move away from cost-reimbursement contracts whenever "appropriate."

2. Have you heard of the FPVO concept before? If so, what was your exposure to the concept?

(DL) The concept is not new but the name is. It is similar to fixed-price research and development which has never been widely practiced.

(JB) Yes. This FPVO concept is not entirely new and various aspects of it are even reflected

within existing regulations. Note also that "CAIV" or "Cost as an Independent Variable" focuses very heavily on funding limitations and trade space within technical requirements to achieve maximum value for available dollars.

(EH) I was not aware of it before you brought it to my attention and I read the PBA report.

(RF) Yes. My only exposure has been in concept development studies.

(SP) Yes, I participated in the PBA study effort.

3. The FPVO contract type was recommended as a contracting reform initiative in 1999. Why do you think it is still in the concept phase? Why do you think acquisition initiatives in general are difficult to implement?

(DL) There are several reasons. Competing initiatives, such as performance-based contracting, overshadowed other recommendations. The top has an 'ivory tower' mentality that does not reflect the reality in the field. Those in the field want to follow policy. Training, education, expectations and communication, communication, communication are needed to invoke change.

(JB) This action (FPVO recommendation) was not taken - and while I cannot speak to the reason for this, I believe it to be at least partly as a result of significant disagreement on the panel who prepared the PBA report - to such an extent that the report was issued with a cover sheet

stating the principals did not agree with the entire content.

Attorneys especially often recommend against breaking new ground; I frequently hear "we have no experience with this" as a reason not to implement new procedures. Contracting officers and attorneys are fond of using the '60-Minutes' test-an assessment of how a certain action would look in the evening news media bent on protecting the taxpaying public.

(EH) It has limited applicability. (Culture) is resistant to change, comfort in using what worked in the past.

(RF) Has not been acted upon because of the paradigm of a customer requiring a fixed amount of services or supplies for a fixed price has been too hard to overcome.

(SP) It (FPVO) has not been acted upon because it was recognized as the sham that it is. I think the three primary reasons reforms are difficult to implement are: (1) the initiatives are ill conceived and thus face resistance from those that recognize their inherent flaws; (2) inertia - change is difficult to stimulate when it challenges the construct within which the workforce has achieved success, especially when it is not adequately demonstrated that there is a burning need to change; and (3) concerns about job security - change often means displacement of workers as they are made obsolete or redundant, and absent some assurance that they can continue

to participate meaningfully in the changed environment, there is resistance.

4. Do you have a contract now or have you had a contract in the past where the FPVO would have been applicable and its use desired? If so, what was the nature of the procurement?

(DL) The concept has been used before without the name. It has been used on smaller programs. NASA has used a fixed amount for R&D. May also have a "fixed-price concept demonstration."

(JB) The examples are endless. I'll give you two simplistic examples that are a bit different from those in the report --

One, a case in which a military command desired to train its military staff and to have accredited private post-graduate institutions grant a master's degree in International Studies that would give credit to students for certain military classes they were required to take. Only a performance based and variable outcome contract would suffice, since each accredited institution had its own requirements, course list, and course content, and must follow those in order to maintain its accreditation. The fee per student was clearly amenable to fixed-price structure, on similar terms to other students of the institution.

Another is total ownership cost (TOC) reduction initiatives - fixed-price contracts might be awarded to encourage TOC reduction, in which contractors would be paid a fixed amount to

initiate and implement changes that would result in increased reliability, maintainability, or commonality. These might be approached as value engineering, but typically the value engineering change proposal (VECP) process is lengthy and often viewed as ineffective or onerous by all parties. A FPVO contract would be a good substitute.

(EH) Not in Northrop-Grumman Ship Systems

(RF) Unknown

(SP) Sure, we could have used it, but it would have provided no real enhancement to the existing repertoire of contract types.

5. Do you think the FPVO could be used successfully in performance-based contracting and performance-based service contracting?

(DL) Think about how you spend your own money. If you were the one seeking goods or services you would be unlikely to get what is required or desired if you can't define the result you want sufficiently.

(JB) In concept, performance-based contracts are outcome-based contracts. If the focus is on outcome, then a FPVO contract is certainly appropriate as offerors should have different solutions, methods, and so on. The FPVO approach is almost by definition outcome-focused.

(EH) Possibly, but with limited applicability.

(RF) Not until customer expectations at all levels are aligned with clearly identified

variable requirements. Conversely, clear measurement of the contractor's performance against the identified variable requirements is necessary.

(SP) It can be used no more successfully than could some less contrived form of contract. You are no more assured of a worthwhile result when using FPVO than you would be in using a cost reimbursable type of contract.

6. Do you think the FPVO would require more Government monitoring than CR type contracts, the same amount, or less monitoring?

(DL) We buy staff work using FPVO, both Government civilian and military employees (Ms. Lee gave the insightful comment that we hire people at a fixed price and the outcome per individual varies widely). The extent of monitoring required is unclear.

(JB) In the famous words of all Government contracting - "It Depends." I believe you will have a range of monitoring needs based on different contract requirements. In some instances, the difference between FPVO and cost reimbursable may lie not in how much monitoring is required, but in who does the monitoring. We would expect to see a significant reduction in oversight of the accounting processes, but by the same token, we might see an increase in claims, modifications, change proposals, and so on, all of which take a significant level of administrative effort. I think an important

element that is sometimes neglected by proponents of PBA is that a prudent contractor may feel he can maximize his overall profits on Government contracts by establishing a separate Government business unit with a cost-accounting standards compliant accounting system. The reason for this is that when a claim, change order, or modification is necessary, the notion of "allowable cost" comes into play for determining the value of such orders. Where a non-compliant system exists certain costs the company includes in its business records would have to be identified and excluded from the negotiation of value. Additionally, the Government is keenly interested in assuring that it pays reasonable prices - for oversight agencies like the GAO, this often equates to assuring that the Government does not bear a disproportionate share of company costs through what we would traditionally consider inappropriate pricing mechanisms or allocations of overheads. There is often a thin line between "what the market will bear" and "gouging" when one thinks of fairness in pricing strategies.

(EH) It should require less, but in practice will probably require more Government involvement due to what is really a cost-type scope of work. The PM will probably not be willing to simply stand by while the contractor proceeds with a scope of work the PM doesn't consider will meet the program needs.

(RF) Initially it may require the same amount of monitoring; however, over time should go down.

(SP) About the same.

7. What incentives do you think are required for the FPVO to be used successfully (provided you think it can be used successfully)?

(DL) The concept has been used. Incentives would have to satisfy requirements for risk. Concept won't work for products or services unless it is for pure augmentation services.

(JB) Incentives are an interesting concept. As the report noted, contract structure (such as performance based payments) can be an effective element of incentive. Competition, where effective, is always a motivator; hope of future contracts is probably the strongest, but leads to some difficulties with the Competition in Contracting Act of 1984 as amended. The hope of future contracts rests on the premise that future contracts might not be competitive (and thus more lucrative and/or less costly to obtain). The Government might find itself in a sole-source situation in which it had less bargaining power and thus was unable to obtain the best pricing and terms on the follow-on contracts. Ideally, competition should be maintained as long as possible in the process, since it is arguably one of the best motivators toward desirable outcomes for the Government.

If FPVO is not abused to result in contracts for which the Government pays money to achieve little or no result, then I believe they can be used successfully. There is a danger that it can be used as a way to escape writing a well-crafted, well thought-out contract using existing procedures, however. As a concept, sometimes it is desirable to put a "tag" on a thought process that will enable learners to categorize a procedure. Such a "tag" can give a new procedure or process legitimacy, and once it enters a common body of knowledge, it is more easily used. **(EH)** As you can tell by my prior comments, I have strong reservations about the effectiveness of FPVO.

(RF) Performance based payments are not suitable since this could become a tool to force contractor to do more than required. Monetary incentives for amount of work accomplished or higher ratings for future competitions would be a constructive incentive.

(SP) Why would the Government want to perpetrate a fraud on the public by maintaining that it is using fixed-price contracting, shifting the risk equation in favor of the Government, when there is not a fixed outcome? The incentives provided to a contractor under this arrangement would be no more or less effective than those that could be provided in a cost-type environment. If you provide performance-based payments, you suddenly move into an environment where the outcome is not

really as variable as you might think because the performance events will dictate a level of performance that may or may not be achievable - increasing a contractor's risk significantly.

8. What rules, regulations and/or statutes would need to change to successfully begin using the FPVO throughout the DoD acquisition community?

(DL) No rules would need to change. You would need to focus more on requirements; how do you price the outcome?

(JB) I believe we currently have authority to use FPVO. Adding a discussion of FPVO and parameters to the Federal Acquisition Regulation Part 16 could be beneficial. Traditional problems with all Government contracts exist that impede ability to implement totally commercial practices, such as the Service Contract Act requiring payment of certain base wage levels and associated requirement for Government insight and oversight of wages. There are others, from TINA to CICA to socioeconomic programs. The whole issue of "fair and reasonable price" is problematic where our notion of a contract is that we may get nothing for our money -- an unacceptable outcome for contracting officers, attorneys, oversight agencies, and taxpayers. There is also longstanding resistance in many contracting communities to releasing Government estimates of price to competing contractors. While a real prohibition does not exist, the strictures of the Procurement Integrity Act have

been so ingrained in procurement staff members that there is a strong resistance to disclosure of such information. Thus, the concept of FPVO and, in some instances, even CAIV can meet with unexpected and unwarranted resistance.

(EH) Nothing I can think of. The key to successful use of FPVO is a PM that will keep hands off in contract administration and a willingness to defend that whatever result obtained was a prudent use of the funds.

(RF) I cannot think of any that would have to be changed. Retraining in writing contracts and measuring a contractors' performance against the variable requirements would be necessary. Most importantly a cultural change is essential.

(SP) Don't see this as a statutory issue, but you would have to change Part 16.

9. The three scenarios (see Appendix D.) are examples of procurements in which it is suggested the FPVO should be used in place of CR types or other FP contracts. If the FPVO were an option, would you use it in these or similar acquisitions? If not, please state reasons why.

(DL) Based upon previous responses this question was not asked of Ms. Lee.

(JB) Example 1 - Unmanned Air Ordnance Delivery System (UAODS) - The FPVO contract is only one option that could be considered in this scenario. Another potential method would be a "tournament" contract in which the same pool of money is

posted as a payment for a design and prototype (especially when there is already a significant body of research and a number of products in production given similar existing technology). The prototype that works best gets the prize and the potential for a contract.

Example 2 - Pierside Restricted Availability (PRAV) - This is, it seems to me, an appropriate application of FPVO. The more traditional approach would be a competitive best value dissimilar competition in which we provide priorities to competing contractors, obtain offers, negotiate the work to be included within and monitor. However, this can be problematic since repair contracts frequently bring to light problems that were not previously obvious. Thus, the FPVO is more likely to result in completion of the maximum portion of the necessary work within that budget amount. Oversight by knowledgeable technical staff to assure value would be crucial. Putting this effort within a larger context would be ideal. Multiple awards for similar work could be made, with the contracts set up so that the repair contractors would be measured on their productiveness, quality and value provided for investment. Future work would then be awarded based on this performance rating under the contracts. In the old days, simplified purchase procedures used a similar technique - called a "not to exceed" order, in which a value was provided in the award, and the contractor could do the work and

bill an amount UP TO but not in EXCESS OF that amount.

Example 3 - Consultant Services - We are talking about using in excess of two person-years of effort for this research, well over half million dollars, assuming a per-hour fully loaded payment to the consultant of \$150. I would be unlikely to use FPVO in the way you suggest for these services since the likelihood of significant duplication of effort seems to me to be wasteful.

(EH) UAODS - you don't need to create a new form of contract for this scenario. It's been used many times in the past but may not be acceptable currently because of the USD (AT&L) policy against requiring contractors to make company investments in developing DOD programs. The scenario would likely lead to the contractors making IR&D investments to supplement the NAVAIR funding. Rather than a report, I would recommend the deliverable be a fully priced production proposal.

Mine Countermeasures Support Ship (MCS)-12 - The FPVO contract would work but again you don't need a new form of contract. Individual repair items can be individually fixed-priced by the repair yard and the Supervisor of Shipbuilding (SUPSHIP) negotiates the FFP.

Consultants - FPVO would work but why not use a standard FFP. As long as the consultants are carefully selected, the deliverable should be satisfactory.

(RF) It is not clear that it could be used in Example #2. Consideration must be given to the complexity of the individual repairs along with the number of repairs accomplished. A monetary incentive would be appropriate.

(SP) No because your scenarios are basically flawed: #1 is just another means of forcing contractor investment (in order to potentially secure follow-on work) in programs in contravention of USD(AT&L) memo of 16 May 01 (Ref.21); #2 If it were really true that the requirer would be happy with whatever gets done, you would not need a fixed-price instrument; #3 Why split effort between two firms in this scenario when a competition beforehand could select the best qualified and allow that firm to expend all the money in producing a viable study - rather than having each perform essentially the same effort for half the money?

10. Do you think a contractor and the Government could agree upon a fixed-price for these types of procurements?

(DL) Based upon previous responses this question was not asked of Ms. Lee.

(JB) As a general note, I am always astonished at what we can get contractors to sign up to. Sometimes, they sign up to an agreement, and rely upon ambiguities to assure that they can "get well" through changes. Other times, we may get them to agree to a fixed price, but that price is

inordinately high and would be unacceptable. In a FPVO environment, however - the risk is the Government's since a usable product is not really part of the requirement. In addition, using what we consider to be a poor quality product or low level of effort as adverse past performance in the future may be problematic, since we enter the contract with the notion that the outcome need not be useful or the amount of repair to be done is at the contractor's discretion.

(EH) Yes, but For UAODS the USD (AT&L) policy could be a problem.

(RF) Yes, except for Example # 2. See comments in answer 11 for my concerns. (It is not clear that it could be used in Example #2 consideration must be given to the complexity of the individual repairs along with the number of repairs accomplished. A monetary incentive would be appropriate.)

(SP) Sure, show me the money! But, do you really want a contractor to price in all sorts of contingencies in order to achieve a fixed-price for effort that should be priced in some manner that allows a less conservative approach to pricing?

11. How effectively do you think the FPVO would mitigate cost and performance risk in the scenarios?

(DL) Based upon previous responses this question was not asked of Ms. Lee.

(JB) Example 1 - (UAODS) Cost risk should decrease somewhat; performance risk would increase.

Example 2 - (PRAV) Cost risk significantly reduce; performance risk could increase marginally since we do not have insight into the effort expended and would need highly knowledgeable technical oversight.

Example 3 - (Consultant Services) Assuming we have the right dollar value on the effort, cost risk would be somewhat reduced, but I believe performance risk would increase - the quality of end product could decline and generate additional contract administration arguments - for example, whether the Government was providing needed information or the information was in an unforeseen location using up lots of funds on travel.

(EH) If in fact the PM is willing to let the contractor proceed without Government involvement/interference it might work.

(RF) It would be very effective in mitigating both; however, one must understand that the customer needs may be less than satisfied.

(SP) Risk on whose part? Inappropriate use of fixed-price contracts increases contractor risk, even in a variable outcome situation because expectations are different in a fixed-price environment. FPVO would technically bind both the price and the risk, but the risk of not

obtaining a useful product will still exist for the Government.

12. Do you think the contractor's best effort would satisfy the Government's goals/desires?

(DL) Based upon previous responses this question was not asked of Ms. Lee.

(JB) If best effort was provided by a contractor, and assuming that the Government expectations relate to reality, yes.

(EH) Possibly, but I can't visualize a PM not getting involved if he doesn't like the prospective outcome.

(RF) The customer goals/desires may not be satisfied unless the customer has accepted the changes in culture needed (i.e., acceptance of other than a complete accomplishment of requirements).

(SP) Might or might not. Most contractors will be eager to satisfy the Government's needs, but their best efforts may not be good enough.

13. One of the advantages of the FPVO is that the fixed-price eliminates the baggage that comes with CR contracts such as auditors, checkers, etc. Do you think this is true? If true, is this a good thing?

(DL) You still have politics, Congress, taxpayers and protests. Auditors are needed in this environment.

(JB) Yes, I would agree that a fixed-price eliminates much cost-accounting baggage. It often adds to other oversight problems, such as an increased need for incentive arrangements and it certainly does not reduce the need for technical involvement. Some work effort may move from administration to contract formation - where there is greater need for information, creative contract structure, and detailed negotiation of expectations, assessment of work effort and structuring requirements in outcome-based terms, and resolution of ambiguities in documents.

(EH) With respect to auditors it's probably true. As noted above, because of the nature of the work, the likelihood of extensive PM involvement, whether permitted by the contract or not, is high.

(RF) With respect to auditors it's probably true. As noted above, because of the nature of the work, the likelihood of extensive PM involvement, whether permitted by the contract or not, is high.

(SP) Not necessarily true. It is very likely that the program office will have to substitute its own oversight in ensuring that it is getting value for its money.

14. What do you perceive are the strengths and weaknesses of the FPVO?

(DL) Weaknesses are definition of requirements (Government is unclear as to what it is after)

and obligating funds for which there is no remedy for poor performance. The one strength is that it is easy use.

(JB) FPVO recognizes constraints of price. In fact, one might almost call it "Price as an Independent Variable" contracting if one extended the CAIV idea. We are essentially buying the maximum value we can for a stated fixed-price. This focus on price up front, if handled well, can lead to useful dialogue and open communication. To the extent that outcomes are poorly defined there is a danger that the effort will lack direction and, therefore, purpose. Outcomes are best measured when there is a goal in mind.

(EH) Weaknesses - as noted in the responses above, previous attempts to force not well-defined work scopes into a fixed-price environment have generally not worked.

(RF) Strengths - Contractors will focus on the critical requirements they can accomplish for the dollars. Weakness - The customer may not get everything they wanted.

(SP) As already indicated, FPVO is a sham that serves no identifiable purpose other than to allow the parties to indicate that they are operating in a fixed-price environment.

D. CONCLUSION

Each of the high-level acquisition community members participating in this research effort provides a slightly

different assessment of the FPVO concept from the others. The common thread is that all five participants looked at the FPVO concept with skepticism as to its applicability and utility.

Each participant was provided with the opportunity to offer any additional comments on the FPVO concept they thought necessary. Here is what they had to say:

(DL) There is no room for the FPVO (in Government contracting)

(JB) One of the things that concerns me about FPVO contracts is an external environment requiring not only results from contracts, but also positive results. In an FPVO environment where one potential outcome is a negative one (the project is shelved since it is not feasible, for example) there is a taint of "failure" on the project and on the Service that supported the project. Congressional funding is often predicated on "success"; GAO oversight of contract spending revels in identifying "waste" or taxpayer dollars ill spent. In this environment a tacit recognition that "best effort" might not result in "success" is likely to be politically detrimental to a program.

(EH) As you can tell I have a decided lack of enthusiasm for the FPVO type of contract. In limited situations it might be beneficial, but in my experience attempts to fit cost-type scopes of work into fixed-price contracts end up being contract administration nightmares. I suggest

you research very thoroughly the literature and on selection of form of contract. My recollection is that for fixed pricing you need a definitive scope of work. If a pricing review doesn't indicate fixed-pricing is appropriate, don't try to force the work into an inappropriate form of contract and call it "acquisition reform."

(RF) None

(SP) If it is not already apparent, I am not a fan of FPVO. If risk is so great that a cost-type approach is appropriate, use it! If not, use a truly fixed price instrument.

It should be recalled that one of the impetuses behind the FPVO concept, PBA and acquisition reform itself is to make current Government practices more like those used between commercial firms. The negative perceptions and sentiment toward a concept that began with the noble ideal of intelligent acquisition reform is to say the least surprising.

E. SUMMARY

This chapter presented the information as it was received from the study participants. The next chapter analyzes these data and applies the analysis to the issues of FPVO contract type applicability, role in acquisition reform, and barriers to implementation.

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IV. ANALYSIS OF DATA

A. INTRODUCTION

This chapter provides the researcher's analysis of the data presented in the previous chapter and analyzes the relation to key issues. The researcher has identified the three key issues relating to the FPVO as: (1) applicability of the FPVO; (2) the FPVO's role in acquisition reform, and; (3) barriers to implementation of the FPVO.

B. ANALYSIS OF DATA

1. Contract Type

While there is a general desire to use FP type contracts whenever possible, the responses indicate FP vehicles should not be used where they are inappropriate. To use a FP type contract requires the desired outcome to be sufficiently defined so as to mitigate risk for all parties involved.

The Department of Defense, and the Navy in particular, often cite the case of the A-12 program when discussing the appropriateness of contract type. The A-12 program contract was a fixed-price-incentive contract for what basically amounted to a research and development effort. When Northrop and Lockheed refused to agree to enter into a fixed-price contract, the contract was awarded to McDonnell Douglas and General Dynamics. McDonnell Douglas and General Dynamics were led to believe competition existed and so reduced their bids through two rounds of best and final offers (Ref.7). Two years after award, the Navy was notified the scheduled first flight would be significantly delayed and the full-scale development effort would overrun the ceiling price. The Navy was also informed not all

performance specifications could be met. Three years after contract award, the Government terminated the A-12 contract for default (Ref.1).

Seven years after the Government issued the termination for default it was converted by a Court of Claims ruling to a termination for convenience. The court ordered the Government to pay McDonnell Douglas and General Dynamics \$3.877 billion on a contract originally expected to cost \$3.981 billion (Ref.1). No viable airplanes were produced and the Government had little to show for this incredible expense.

The striking failure of the A-12 program is sufficient evidence for many in the acquisition field to avoid fixed-price type contracts for anything but clearly defined or otherwise low-risk acquisitions. This attitude is reflected in the study participant's responses.

2. Incongruence

a. Research and Development versus All Comers

As Ms. Lee points out in her response to question number six, we in Government acquisition use the FPVO approach frequently in that we hire people at a fixed salary without knowing with certainty what their output will be. For example, the output (outcome) for GS-12s is different for each just as each O-4 has a different level of output. Of major difference between hiring and firing practices and the acquisition of research and development items is the magnitude of risk. Individual managers have the ability to either closely supervise or not closely supervise, they can assign co-workers to train and educate new personnel and they can usually detect problems quickly due to the close proximity of the manager and the

workforce. In this environment, offering a fixed wage and receiving a variable outcome is both anticipated and reasonable, the reasonableness stemming from the manager's ability to assess and mitigate risk according to individual need.

Defense procurement, particularly research and development for major weapon system acquisition, is not conducive to the same oversight and periodic course correction found in the management of personnel or in the acquisition of common commercial goods and services. The risk inherent in attempting to transform a concept into a tangible object must be recognized and valued so as to determine the procurement method with the highest possibility of success. In R&D acquisition the Government is told to stay at "arms length" and the contractor seeks to withhold information on costs and profit. There does not exist the same hierarchy between Government and contractor as is found in the employment scenario; the contractor is working for the board of directors, not the Program Office.

b. Outcome versus Expenditure

In her response to question five, Ms. Lee compares Government expenditure of funds to how individuals manage their own finances. Would an individual be willing to give another money with no guarantee of the outcome? The closest personal example is investing in the stock market where returns on money invested are not guaranteed, yet millions of people daily put money into stocks, mutual funds and bonds. Presumably individuals who invest also consider risk and manage that risk by allocating investments across the risk spectrum.

This investment example is unique. Few if any individuals would be willing to give money to a plumber who can not assure he can repair a leak or give money to a mechanic who cannot guarantee he will repair a car. In general, individuals want to know the outcome before opening their checkbooks. So too the Government wants to know what it will be getting in exchange for millions or billions of dollars paid out.

3. Purported Benefits of the Fixed-price, Variable Outcome Contract

a. Disengagement

One of the selling points of the FPVO is that it will help to disengage the Government from the contractors. If the FPVO can actually affect this disengagement, the result should be less monitoring and oversight on the part of the Government. Projecting further, less oversight would mean less oversight infrastructure (less expense) for the Government. The PBA report states the buying office has an "affirmative obligation" to monitor progress and performance-based payments could be used effectively in conjunction with this monitoring (Ref.23, p.72). This is contrary to the claim the FPVO contract will allow the Government to disengage itself from the contractor and monitor less.

The Government is unlikely to take a completely hands-off approach for high-risk contracts, regardless of contract type used. The hierarchical nature of our Government requires information to flow up the hierarchy and that flow of information increases in direct relation to the priority and/or riskiness of the acquisition. This information required to flow up is typically obtained from Program Offices that must confer directly with contractors.

In short, high-risk acquisitions will generally always require a high degree of oversight and monitoring due to the risk and expense involved.

b. Increased Competition

The FPVO contract was conceived of in part to encourage traditionally non-Defense contractors to take part in DoD acquisitions. The FPVO contract also requires past-performance to be used as a key component of risk mitigation. The Government has no past performance data for defense acquisitions on traditionally non-Defense contractors. This information could be obtained through additional market research but the information obtained may not be as robust the Government may wish (on the other hand, it may be better). Relying upon past-performance data between commercial firms may increase the three main categories of risk and this increased risk may serve to exclude the very contractors the FPVO contract was designed to attract.

c. Multiple Award

The FPVO concept also calls for multiple awards to mitigate risk. Adding contractors increases the amount of work necessary for acquisition planning, source selection, contract administration and closeout. Multiple awards increases the amount of administration required both pre-award and post-award and may increase the number of protests. While the "monitoring" function may decrease under FPVO, it is very likely other components of the contracting process may experience an increase in required effort.

The PBA report also states the competitive aspect will motivate competitors to "maximize its accomplishments

particularly when there is a follow-on program and the accomplishments of the FPVO contract will play a major role in selecting the winner for the follow on effort." As Ms. Blake points out, this element may lead to problems complying with CICA.

d. Commercial Practices

The PBA Team's charter directed them to identify actions required to make DoD acquisition more like commercial industry (Ref.23, p.ES-3). One of the main selling points of the FPVO concept is that it emulates commercial business practice. To ascertain the validity of this contention, the researcher interviewed Dr. Louis Scarmoutzos of MVS Solutions, Inc. and Mr. Mike Kanze, CPM, of Cornerstone Services (Refs.12,25). MVS Solutions, Inc. is an "international consulting firm that provides scientific, technical and business assistance to companies and Government agencies (Ref.16)"; Cornerstone Services is a management consulting firm (Ref.12). While the research was by no means exhaustive, neither Dr. Scarmoutzos nor Mr. Kanze had ever encountered a contractual arrangement with the properties of the FPVO concept.

When asked to describe a common or appropriate contract type for R&D work, both interviewees described a contract in which the payment is linked to milestones and the level of compensation is based upon driving cost factors (Refs.12,25). Dr. Scarmoutzos described a cost-reimbursement scenario. Mr. Kanze stated compensation could be based upon time, as in a time and materials contract, or some other measure of effort expended by the contracted firm. Mr. Kanze also stated some milestones could be fixed-price if the outcome were determinable and a fair and

reasonable cost could be calculated, while some milestones that are not clearly definable should be on a cost-reimbursement basis. This small sample of private industry indicates the FPVO concept *does not* mirror general commercial business practices for research and development.

4. Satisfaction

In his response to question number eleven, Mr. Foley states "the customer's needs may be less satisfied." Satisfying the Government's goals/desires is only possible if the Government is able to adequately define those goals and desires. If the Government is able to establish a range of acceptable outcomes and the contractor provided an outcome within that range, then the Government should be satisfied. The researcher believes the Government would have a great degree of difficulty determining a range of acceptable outcomes. Even if a range were established, the researcher believes the Government would be dissatisfied unless the outcome at the top of the range was achieved.

The current culture of Government acquisition is the Government desires a specific outcome and for that outcome will pay a certain amount of money. The hands-off nature of the FPVO concept places the control of the outcome with the contractor. The researcher believes the Government is unwilling to relinquish the control of the outcome.

As the case of the A-12 indicates, there may very well be a contractor willing to take on a high-risk fixed-price contract. To many in the acquisition field, high-risk and FP are like oil and water; the two do not and should not be mixed.

The researcher believes if the FPVO contract were implemented some contractors will be found to accept a

high-risk FP contract type. Contractors might then be incentivized to mitigate their risk by building contingencies into the contract, which is in direct conflict with DoD acquisition policy. Building contingencies into the contract would also increase overall contract cost. The researcher further infers meeting the other objectives of an FPVO acquisition (i.e. multiple awards, competition, past performance) would be difficult to satisfy, possibly increasing or shifting risk. The result would be unintended consequences that are unknown at this point.

C. ANALYSIS OF ISSUES

1. Applicability

One of the subsidiary research questions asks "What are the prime applications for the FPVO in DoD acquisitions? Is it more applicable to certain phases of the acquisition process than to others?" Mr. Terry Little, a key member of the PBA Study Group responsible for developing the FPVO recommendation states the FPVO is "applicable to demonstrations, design efforts, studies, basic technology development, concept exploration." Mr. Little is essentially saying the FPVO contract type is applicable to Phase A of the acquisition process.

The FPVO concept is designed to align DoD with commercial practices, encourage traditionally non-DoD contractors to participate in DoD contracts and reduce risk in the R&D/S&T phase for new technology and reduce risk for other high-risk contracts. The research indicates the FPVO concept would not do any of these well. The research also indicates for every contrived scenario in which the FPVO

could be used there is an existing contract type that will meet the objective with less risk to the Government.

The FPVO was conceived of to mirror the way commercial firms contract for S&T acquisitions. The PBA report does not address whether or not a feasibility study was ever conducted to discover if DoD could emulate commercial firms under current regulations and restrictions. Commercial firms are motivated by profit and loss and maximizing shareholder value. Obtaining best value at reasonable cost motivates the Government. Commercial firms can form long-term relationships with each other; the Government must comply with CICA. Agreements between commercial firms are not subject to CAS disclosure, rather, they rely upon boards of directors and the market economy to determine legitimacy. Commercial firms do not have to satisfy the Buy American Act or the Small Business Administration. Commercial firms are simply not restricted in the way the Government is restricted. These restrictions on the Government make the 'invisible hand' of market forces less efficient and sometimes totally ineffective. So the question remains; can the Government be as efficient using commercial practices as commercial industry given the differences in motivation and restrictions? The researcher thinks not.

The risks involved in a CR vehicle and the FPVO are essentially the same. Reduced oversight touted as a benefit by the FPVO recommendation will only serve to increase contractor profit margins and will not decrease Government cost risk due to the Government's culture of adding money to programs until the desired result is achieved or funding is withdrawn. Reduced infrastructure will never happen due

to the need to maintain that infrastructure for CR type contracts. (Ref.2)

All of the research participants display skepticism toward using the FPVO concept in any situation. As previously stated, these individuals are active reformers and leaders in the field of acquisition. The fact that they question the FPVO concept's applicability in any situation is noteworthy.

2. Role in Acquisition Reform

The FPVO concept was conceived to change the business practices of DoD acquisition. The FPVO was designed to allow DoD to mirror commercial S&T acquisition strategy, to encourage a broader range of participants, to reduce the cost risk of high-risk acquisitions and in general to be a risk reduction vehicle. These are all noble aims and most in acquisition would agree reform efforts should focus on these areas. Is the FPVO contract the correct contract type to accomplish these goals? The research demonstrates implementation of the FPVO would, in fact, change practices but would probably make the process worse off than before. Allowing the contractor to determine the final outcome of an acquisition introduces a level of risk most program managers, contracting officers, and other acquisition decision makers will refuse to accept. The plausible range of outcomes established by the Government will incentivize contractors to control costs by aiming for the bottom of the range. Even if an outcome in the range is not achieved the contractor has no cause for concern as the FPVO promises full payment regardless of the degree of success.

To determine whether or not the FPVO has a role in acquisition reform we must first conclude if the reform is

wanted and needed. As indicated by the research, there is a desire to do a better job of selecting the appropriate contract type and incentives based on the risk and type of acquisition. There is no sustained imperative to do away with cost-reimbursement contract types.

Reform can begin at either the bottom or the top of an organization. Reform emanating from the bottom is typically spurred out of necessity as a way to allocate scarce resources more efficiently. Reform from the top generally stems from experts who have witnessed a pattern of undesired behavior and wish to improve the process. Whether generated by the many or the few, reform initiatives will take hold if they are well-reasoned, practical, add value to the process and are implemented with commitment on the part of those involved.

3. Barriers

While there are no statutory or regulatory changes necessary to use the FPVO in DoD acquisition, there are numerous barriers preventing the recommendation's adoption by the acquisition community. Some of the barriers can be overcome, as they have in previous reform efforts. Other barriers unique to this particular recommendation are insurmountable.

a. Culture

The culture of the acquisition workforce and its resistance to change has been addressed in numerous articles as has the oft experienced disconnect between policy makers and those performing the actual work. While this may be a barrier to overcome, it can and has been overcome in the past (performance-based contracting as an example).

Cultural resistance to change can be overcome by publicity, training, regulatory changes and by practical demonstration. The acquisition workforce will be quick to adopt a reform initiative that either has proven it will benefit them or has a good chance of benefiting them. Champions are necessary to bring about cultural change. A person who energetically promotes a change and manages the implementation with intelligence and conviction will receive much better results than will the promulgation of a faceless directive. The culture and connectivity in bringing about change should be thought of more as hurdles than insurmountable barriers.

b. Enthusiasm

The lack of enthusiasm for the FPVO concept by leaders of both defense and commercial acquisition is also a barrier to implementation. If the policy-makers and trendsetters do not embrace a reform issue it is unlikely a genuine effort will be made to implement a concept. To change behavior from the top down ideas must be nurtured, supported and demonstrated. Those doing the actual work must receive sufficient guidance and training and be rewarded for modifying their behavior through reasonable incentives.

c. Non-commerciality of Government/DoD

DoD is huge compared to even the largest of corporations. Its sheer size brings with it management challenges unheard of in the commercial sector. The Government is not motivated by profit and loss nor must it react to economic influences. What commercial enterprise can rationalize deficit spending? What commercial enterprise ignores the global economy when contracting for Science & Technology and conducting Research & Development

of new technology? What commercial enterprise must have expenditures approved by a fractional legislative body containing 535 members with distinct agendas? The Government and DoD are unique and decidedly *un-commercial*.

Government acquisition does not exist in isolation. The acquisition process involves all three branches of Government, numerous departments and agencies and of course the commercial industry that supplies DoD's needs. Any initiative to adopt commercial practices that focuses solely on acquisition and ignores the rest of the players and processes will fail. To employ commercial-like practices the rest of the Government and DoD must be willing and able to become more commercial-like too.

d. Interests, Incentives and Motivation

Ancillary to the discussion of the differences between the Government and the private sector is a discussion of the primary interests, incentives and motivating factors for each group. What drives the Government? Government interests, incentives and motivating factors are wide and varied, but essentially the Government seeks to maintain individual property rights, promote the economy and establish foreign and domestic policy that benefits the majority of Americans.

DoD takes its direction from the Government through the National Military Strategy, Quadrennial Defense Review and other key documents that prioritize the missions of the Armed Services. The Armed Services then compare the tools available to them to the missions they are required to perform and develop requirements based upon the gaps between tools necessary and tools currently available. DoD is incentivized to procure the best possible tools so as to

have the highest probability of meeting mission goals. DoD is motivated to meet mission goals and is critiqued on how well and how often it meets goals. DoD is interested in protecting and satisfying the defense needs of the nation. DoD is not interested, incentivized or motivated to increase the wealth of American citizens.

Commercial firms competing in a global economy have very different interests, incentives and motivating factors. Commercial firms are interested in survival. To survive, commercial firms must meet forecasted earnings targets, maximize shareholder value and generate revenue. Commercial firms are incentivized to become leaner so as to enable competition, to be innovative, to be first to the marketplace and to control costs so as to increase share worth.

The different interests, incentives and motivating factors often create friction between DoD and commercial industry. In the case of the FPVO concept, DoD wants to invest in a program that will enable the Armed Services to accomplish their mission while the contractor wants to control costs to the maximum extent possible and still supply the requirement. Provided DoD can successfully establish a range of outcomes, the contractor will be incentivized to satisfy the requirement at the lowest cost. Once the Government establishes the range of outcomes, the contractor has total control over the final outcome. The contractor's emphasis is on cost control. There is little incentive to aim for the top of the performance range when a less costly solution will presumably satisfy the requirement.

This means under FPVO, DoD will likely receive an outcome in the lowest part of the range, which may in fact be less than desired, or in other words a sub-optimization. The probability DoD would ratchet up the range so as to achieve what they actually want is high. With "range creep" DoD should anticipate "cost creep" as well.

e. Past Performance

The FPVO concept relies heavily upon multiple awards and contractor past performance data to limit the risk to the Government. How reasonable is this reliance? As previously stated, multiple awards means duplicative effort on the part of acquisition professionals. Instead of one contract to award there are now three. Instead of one contract to administer there are now four. What is the contracting officer to do when only two or three companies have bid and a multiple award is desired? He/she must formulate a strategy to divide up the requirement so as to limit the possibility of protest and legal proceedings. Multiple awards also could mean an exponential increase in the amount of protests and litigation experienced on Government contracts and increased administrative costs.

Past performance is its own problem. Opening the doors to non-traditional contractors will hopefully generate healthy competition but might also increase risk. The Government will likely have no current or relevant past performance data on these non-traditional contractors. The source selection process then would favor the traditional defense contractors over the new entrants, and may discourage new entrants from further participation.

In the previous section the researcher suggests contractors will be incentivized to aim for the least

costly solution. Under the FPVO contract type, this means contractors will consistently aim for the lower end of the acceptable range of outcomes. How does one grade contractors who meet the minimal requirement? Technically, the contractor provides what the Government asks for and so must be given high marks. In reality, the contractor may consistently sub-optimize the outcome in an effort to control costs. There may be a desire to exclude certain contractors who consistently sub-optimize the outcome but it would be extremely difficult if not impossible to justly exclude a contractor who consistently sub-optimizes the outcomes but provides goods or services within the Government specified acceptable range.

We must also consider how accurate is the methodology for analyzing and applying past performance data. There is no central database for past performance, data are typically maintained locally by contracting commands. For every past performance file there is likely a different method for collecting data. How current and reliable is the information? Is past performance a priority at all commands or is it a task assigned to the newest member with the least experience? How heavily is past performance currently weighted in source selection? The answers to these questions will vary from command to command and contracting officer to contracting officer.

The FPVO concept is propped up by the pillars of multiple award and past performance. As I have shown, multiple awards brings with it management challenges and past performance data can and often are subjective rather than empirical.

f. Risk and Control

I believe the most significant barrier to implementation of the FPVO concept is risk management. The FPVO concept is designed to limit Government risk and apportion risk appropriately for S&T and other risk reduction contracts. Does the FPVO actually do this? It does not because the key decisions that lead to the outcome are left in the hands of the contractor.

The FPVO contract type allows a range of plausible outcomes. Cost, schedule and performance risk may actually increase beyond an acceptable level due to the myriad solution sets possible. This increase in risk is due to the fact that the contractor, not the Government, ultimately selects the outcome from pre-approved alternatives.

The Government may legitimately be able to establish a range of outcomes that includes less than what it wants. I do not think the Government would have the trust and confidence in a contractor to provide S&T funds and not want a full accounting of where those funds are spent. I do not think the Government, in particular program managers and service acquisition executives, would be willing to allow the contractor to determine the final outcome.

There is a direct correlation between control and risk. The less control the Government maintains, the higher the risk the outcome will be less than desired or not materialize at all. In creating a situation in which the Government has little control over the actions and expenditures of the contractor, the FPVO introduces an unacceptable level of risk into acquisition.

D. CONCLUSION

The analysis of the research indicates lengthy legislative proceedings to change laws and statutes are not holding the FPVO concept recommendation back. The research does indicate there is great reluctance on the part of leaders in Government and civilian acquisition to embrace the concept and actually use it in real procurement. This reluctance is based upon the belief the FPVO contract will increase the risk of high-risk procurements and result in an increase in cost, outcome sub-optimization and program failures.

The research also indicates the goals of the PBA Study Group, relative to the FPVO recommendation, cannot be arrived at through the creation and implementation of the FPVO contract type. If the FPVO contract were to succeed in attracting traditionally non-DoD contractors, the risk of performance by those contractors potentially increases due to lack of past performance data. Further, the research indicates less oversight might be obtained but contractor profit margins and overall cost might increase. Reduced oversight for some number of contracts may not translate into reduced infrastructure. The FPVO contract could have detrimental unintended consequences.

Finally, the research indicates there is a general desire to develop a fixed-price contract for R&D (Refs.17,22) but there is no immediate need. There is, however, an imperative to adequately and consistently match acquisitions to the appropriate contract type and select motivating incentives.

E. SUMMARY

This chapter analyzes the research data detailed in Chapter III. The next chapter draws conclusions based upon this analysis and offers sound recommendations to be used by those in acquisition and acquisition reform.

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V. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

This chapter provides sound conclusions and recommendations to acquisition reformers and DoD acquisition policy-makers with regard to the future of the FPVO concept. This chapter will answer the question as to whether the FPVO contract should be tested and implemented or whether it is an idea that requires no further thought or decision. This chapter will bridge the gulf of knowledge that exists to permit decision makers to make an informed decision.

B. CONCLUSIONS

1. **In its current form, the Fixed-price, Variable Outcome contract type is inappropriate for use in Department of Defense acquisition.**

The FPVO concept requires the Government to establish a range of acceptable outcomes and then relinquish control of outcome selection and execution to the contractor. This loss of control introduces an unacceptable level of risk into the equation. Additionally, there are many "ifs" that must be satisfied such as "if" the Government can establish a range, "if" the Government can live without cost accounting, and "if" the contractor will put forth a genuine best effort.

The FPVO concept would be successful in an optimal scenario which includes a Government that can cogently spell out its terms, a forthright contractor interested in program success and satisfying the requirement, accurate past performance data, the existence of motivating incentives and competition. Rarely are all of these elements optimized. More often, several or all of the

elements are sub-optimized to some degree. The FPVO concept requires perfect conditions to be an effective and useful tool. Perfect conditions are not likely to occur.

The FPVO concept would not be the best option available to contracting officers. For every scenario in which the FPVO could be used, there is an existing contract type that could also be used with less associated risk. The risk is reduced through the Government's ability to define an outcome in the case of fixed-price contracts and through oversight in the case of cost-reimbursement contracts. In all FP and CR contract types currently available, the Government maintains control over the final outcome. The FPVO takes away the defined outcome, reduces oversight and gives up control.

2. The basic objectives of the FPVO concept are still valid.

The objectives the FPVO contract was designed to satisfy are valid and worth pursuing. The FPVO contract seeks to increase industry participation in defense contracting by reducing oversight and emulating commercial business practices, reduce risk and in general increase the likelihood the Government will have its requirements filled using a fixed-price vehicle.

While the FPVO contract is unlikely to accomplish these objectives, the objectives themselves are important to the future of Government acquisition.

3. DoD desires a fixed-price vehicle for S&T and other high-risk acquisitions.

In a Department of Defense Inspector General memorandum dated February 15, 2001 (Ref.17), the Director, Defense Procurement is quoted stating her desire to continue to look for a fixed-price contract type for R&D

acquisition that establishes a fixed amount of funding and requires the contractor to put forth a best effort. While there is no imperative to satisfy an urgent need, it is clear a fixed-price contract type that appropriately manages risk for both parties is desired.

The ability to appropriately manage risk is central to development of this desired contract type. The FPVO concept will increase risk beyond an acceptable point and is therefore not a prudent or feasible option. Any fixed-price contract type for S&T and other high-risk acquisitions must do a better job of apportioning and managing risk than the CR alternative.

4. Cost as an Independent Variable has universal applicability.

The CAIV philosophy is unrestricted in its use and applicability. CAIV can be used in performance-based service contracting, performance-based contracting, price-based acquisition and across the spectrum of contract types. CAIV has great utility in that it both forces and allows the requiring agency and acquisition team to define the requirement and make the tradeoffs. CAIV permits the acquisition community to define and retain control over the final outcome. This is in stark contrast to the FPVO contract type in which the contractor decides the final outcome.

CAIV is known well in some circles and not well-known in others. Though it has been available for some time, CAIV is not well-understood or widely implemented (Ref.27). There is no section of the FAR devoted to CAIV. Guidelines for conducting CAIV tradeoffs are not readily available. CAIV is not yet on the syllabus of some institutions of

higher learning. For CAIV to be understood and used it must be spelled out, defined, publicized and its use incentivized.

C. RECOMMENDATIONS

1. Abandon further discussion and effort on implementation of the FPVO contract type.

This recommendation is supported by this thesis and a DoD Inspector General memorandum asking the USD(AT&L) to revoke the FPVO recommendation. USD(AT&L) concurred with the recommendation to abandon the FPVO concept while stating a fixed-price vehicle for S&T acquisition was still desired (Ref.17).

2. Investigate the utility of a milestone-based fixed-price instrument.

A fixed-price contract type for S&T and other high-risk acquisitions is still desired by the USD(AT&L) (Refs.17,22); therefore, exploration should not stop with the demise of the FPVO concept. The controversy over the FPVO concept centers on two main points, (1) the Government pays the full amount regardless of outcome and (2) the contractor determines the final outcome. A fixed-price instrument that is milestone and level of effort driven may be the answer to counter these problem areas.

DoD contracting professionals already have the FP LOE contract type at their disposal. Under the FP LOE, payment is based upon the level of effort expended, rather than the success of the outcome (Ref.6, p.337). In research and development situations, the mistakes made are often as important as the successes; making a level of effort vehicle attractive to both parties.

To satisfy DoD's desire for a fixed-price contracting instrument for R&D, the researcher recommends altering the

FP LOE contract by increasing the dollar threshold and making the payments both event and effort driven. Increasing the threshold increases the applicability of the FP LOE contract type. Adding event criteria, or milestones, provides the Government with decision points at which it can opt to continue or suspend funding. I call this variation a Fixed-price, Level of Effort Milestone Decision (FP LOE MD) contract (a sample FAR revision is provided in Appendix G.).

As an example, let us say DoD wants to investigate the possibility of bringing down enemy aircraft using an energy pulse. This concept is radical and nothing like it has ever been attempted. The Navy is assigned as the lead Service and is given one million dollars for R&D. Under current regulations, the Navy could contract for a feasibility study using the FP LOE contract up to \$100,000, or, establish a fair and reasonable price and contract with a company using a cost-reimbursement contract type.

Under the FP LOE MD decision, the Navy can contract for a full R&D effort with one company, rather than a study by one and then competitively bid further development. Key milestones are established to provide the acquisition community with decision points. These decision points not only allow for decisions to continue funding or cancellation, but also provide an opportunity to review designs and make trade-off decisions. Each milestone has a fixed-price ceiling. The contractor is eligible to receive the full amount for that milestone provided his level of effort supports payment. Contractors who reach the milestone below the fixed-price ceiling are reimbursed for their allowable and allocable expenses.

The FP LOE MD concept improves upon the FPVO concept by paying the contractor for his actual effort, regardless of success or failure, rather than paying him regardless of any effort at all. The FP LOE MD satisfies the requirement to take an incremental approach to R&D and recognizes funding constraints. The FP LOE MD further improves upon the FPVO concept by maintaining Government control over trade-off decisions and the final outcome.

3. Investigate the utility of a fixed-price vehicle for R&D and other high-risk acquisitions based upon the CAIV philosophy.

A second alternative to the FPVO concept is to develop a contract type based upon the CAIV philosophy. CAIV requires the requirement generator to determine a range of outcomes, much like the FPVO. Unlike the FPVO, CAIV allows the Government to retain control of the outcome. The CAIV philosophy requires the requiring agency and the acquisition team to make the decisions on the tradeoff rather than the contractor as in the FPVO concept. CAIV focuses on a cost objective, as does FPVO, but it does not guarantee full payment without regard to degree of success.

The CAIV philosophy has the potential to reduce risk in high-risk acquisition by requiring the acquisition team to define the outcome within the confines of cost. The CAIV philosophy can be applied to FP and CR type contracts, depending upon the level of outcome definition, risk apportionment and incentives appropriate for the acquisition. The CAIV philosophy mirrors best commercial practices and therefore may encourage non-traditional offerors. The CAIV philosophy is already in use and does not require regulatory or statutory changes.

The CAIV philosophy has the potential of developing into a crossover contract type, i.e. it could be fixed-price or cost-reimbursement, depending upon the situation.

4. **DoD acquisition should explore the development of Decision Support Software to aid contracting professionals in selecting the correct contract type and incentives based upon the properties of individual acquisitions.**

One of the continuing themes from the responses to the research question was the acquisition workforce needs to do a better, more consistent job of selecting contract type and incentives. A decision support system aids the decision maker in correctly selecting from options available based upon inputs. In the case of selecting contract type, the contracting team would benefit from a computer program that recommends contract type and incentives with the highest probability of success based upon risk, contractor past performance, state of technology, etc.

D. ANSWERS TO RESEARCH QUESTIONS

1. **What is the FPVO contract type?**

The Fixed-price, Variable Outcome contract type establishes a firm-fixed-price for a product or service that cannot be well-defined or is chosen not to be well-defined. The requiring activity generates a range of outcomes that are both plausible and acceptable to *them*. The contractor puts forth its best effort to deliver a product or service within the defined range but if unsuccessful for whatever reason (barring criminal activity) still receives 100% of the fixed-price. It is important to note the contractor determines the outcome under the FPVO contract based upon funding and the range established.

2. How is the FPVO the same, similar and or different from the following:

- a. Firm-fixed-price contracts
- b. Firm-fixed-price, Level of Effort contracts
- c. Cost-reimbursement contracts
- d. Time and Materials contracts
- e. Cost as an Independent Variable (CAIV)

The FPVO contract was developed to replace cost-reimbursement contracts in many research and development acquisitions. It is similar to FFP and FP LOE in that a firm-fixed-price is established for the effort. It is similar to CR contracts in that the contractor's best effort is required (also true for FP LOE). As with the Time and Materials contract type, the FPVO contract possesses elements of both FP and CR contracts and is therefore something of a hybrid. Cost as an Independent Variable is included to show the objectives of the FPVO contract exist outside the contracting arena and have become corporate philosophy in major weapon system acquisition.

3. What are the prime applications for the FPVO in DoD acquisition?

The research shows and the researcher concludes the FPVO is not applicable to DoD acquisition. The FPVO concept increases the risk of program failure by reducing oversight and relinquishing control of the outcome.

4. What are the conditions necessary for its use?

The FPVO concept requires a broad range of optimal conditions for it to be used effectively. The optimal conditions required are unlikely to ever occur.

5. What specific recommendations can be made to foster implementation and use?

The FPVO should not be used for any DoD acquisition in its current form. The risk introduced by permitting the contractor to determine the outcome is too great to overcome.

The FPVO concept is not the appropriate contract vehicle for S&T and other high-risk acquisitions. This does not mean a fixed-price vehicle for S&T and other high-risk acquisitions cannot exist. The researcher has suggested two possible alternatives.

E. AREAS FOR FURTHER RESEARCH

1. Investigation of FP LOE

In its current state, the FP LOE contract type has many restrictions to its use and is therefore seldom used. A possible research topic is to validate the continued need for the FP LOE contract.

2. The Fixed-price, Level of Effort Milestone Decision Contract

This contract type is offered as an alternative to the FPVO contract. A genuine opportunity exists to further explore and develop this recommendation and determine its applicability and its effect on risk.

3. A Cost as an Independent Variable-based Contract

A second opportunity exists to develop a contract type designed to effectively manage the risk of R&D/S&T or other high-risk acquisitions. The researcher suggests a contract type based upon the CAIV philosophy that is fixed-price in some circumstances and cost-reimbursement in others.

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APPENDIX A. LIST OF ACRONYMS

The following list of acronyms is provided for a common frame of reference. The acronyms were obtained from basic acquisition and contract literature and regulations.

AAAV - Advanced Amphibious Assault Vehicle

CAIV - Cost As an Independent Variable

CAS - Cost Accounting Standards

CICA - Competition In Contracting Act

CR - Cost reimbursement

DAWIA - Defense Workforce Improvement Act

DFAR - Defense Federal Acquisition Regulation

DoD - Department of Defense

FARA - Federal Acquisition Reform Act

FASA - Federal Acquisition Streamlining Act

FP - Fixed-price

FFP - Firm-fixed-price

FP LOE - Fixed-price, Level Of Effort

FPVO - Fixed-price, Variable Outcome

GAAP - Generally Accepted Accounting Principles

JDAM - Joint Direct Attack Munition

PBA - Price-based Acquisitions

R&D - Research and Development

S&T - Science and Technology

TINA - Truth In Negotiations Act

T&M - Time and Materials

UAODS - Unmanned Air Ordnance Delivery System

USD(AT&L) - Office of Under Secretary of Defense for
Acquisition, Technology and Logistics

APPENDIX B. PBA REPORT FPVO EXAMPLES

Fixed-price, Variable Outcome Example 1 Joint Direct Attack Munition (JDAM) Program

In 1991, the Air Force competitively awarded two contracts for the Preliminary Design and Risk Reduction (PDRR) phase of the Joint Direct Attack Munition (JDAM) Program—an ACAT 1D program to develop a guidance package to improve the accuracy of dumb bombs. The two winning contractors (Lockheed-Martin and McDonnell-Douglas) were to work in parallel over a period of approximately 18 months to do risk reduction and manufacturing development. There were two primary goals. The first was to reduce risk sufficiently to allow entry into a moderate-risk Engineering and Manufacturing Development (EMD) phase. The second, equally important goal was to mature the design and develop the manufacturing processes so that the two contractors could offer firm-fixed-price bids for the first two production lots, as well as non-binding production price commitment curves for the following three lots. Each contractor proposed its Statement of Work. The two contracts were cost plus fixed fee. Prior to the award all competitors understood informally that the Air Force planned to allocate no more than \$40M per contract. After award both winners received the criteria the Air Force planned to use for the EMD down select.

The JDAM PDRR, as well as most similar risk reduction programs, was a perfect candidate for a Fixed-price, Variable Outcome contract. First, the objectives allowed substantial leeway in what the contractor had to do to satisfy them. The statements of work were essentially plans of what the contractor intended to accomplish. Second, the “carrot,” potential for future work, was sufficient motivation to preclude either contractor from a half-hearted or wasteful effort. Third, the \$40M was a firm ceiling. Practically speaking, the Air Force had no money to fund an overrun beyond \$40M. One down select criterion for EMD was cost control during PDRR. This made the likelihood of any overrun essentially zero.

Fixed-price, Variable Outcome Example 2 (Hypothetical)

The Army has a number of field radios awaiting repair at the original manufacturer, a commercial company. There is no prior repair history on these radios. The Army did not buy data that would allow a competitive repair contract. Based upon previous repair costs for similar radios, the Army estimates it has enough money to repair from 50-75% of the radios. Ordinarily, the Army would contract for the repairs using a time and materials (cost reimbursable) contract. In this case, the Army decides to use a Fixed-price, Variable Outcome contract. It proposes to give the contractor \$2M plus an incentive of \$500 for every radio the contractor returns to serviceable status. The contractor accepts. Both the Army and the contractor are pleased with the results.

APPENDIX C. LIST OF INTERVIEW QUESTIONS

1. Do you think there is a genuine desire to move away from cost reimbursement contract types whenever possible?
2. How often is the availability of funds the defining factor in procurement?
3. How often is funding cut or withdrawn from cost reimbursement acquisitions?
4. The FPVO contract type was recommended as a contracting reform initiative in 1999. Why do you think it was never acted upon? Why do you think acquisition initiatives in general are difficult to implement?
5. Had you ever heard of the FPVO before? If so, what was your exposure to the concept?
6. Do you have a contract now or have you had a contract in the past where the FPVO would have been applicable and its use desired? If so, what was the nature of the procurement?
7. Do you think the FPVO could be used successfully in performance-based contracting and performance-based service contracting? If not, why not?
8. Do you think the FPVO would require more Government monitoring than cost reimbursement type contracts, the same amount, or less monitoring?
9. What incentives do you think are required for the FPVO to be used successfully (provided you think it can be used successfully)? Performance-based payments, competition and hope of future contracts were suggested in the PBA report.
10. What rules, regulations and/or statutes would need to change to successfully begin using the FPVO throughout the DoD acquisition community?
11. The three scenarios are examples of procurements in which it is suggested the FPVO should be used in place of cost reimbursement contract types or other fixed price contracts. If the FPVO were an option, would you use it in these or similar acquisitions? If not, please state reasons why.
12. Do you think a contractor and the Government could agree upon a fixed-price for these types of procurements?
13. Do you think the lack of defined objectives would energize or confuse contractors?

14. How effectively do you think the FPVO would mitigate cost and performance risk in the three scenarios?
15. Do you think the contractor's best effort would satisfy the Government's goals/desires?
16. What do you perceive are the strengths and weaknesses of the FPVO?
17. One of the purported benefits of the FPVO is when used with an incremental approach for R&D, it affords both the Government and the contractor to limit time and capital investment by offering a "go-no go" decision points at the early stages of development. Please comment on this purported benefit.
18. One of the criticisms of the FPVO is the contractor could take the money and do nothing (or expend little effort and still get the full amount) – please comment on this criticism.
19. One of the advantages of the FPVO is the fixed-price eliminates the baggage that comes with cost reimbursement contracts such as auditors, checkers, etc. Do you think this is true? If true, is this a good thing?

APPENDIX D. THE SCENARIOS

EXAMPLE 1

DESIGN STUDY OF UNMANNED AIR ORDINANCE DELIVERY SYSTEM (UAODS)

Scenario:

NAVAIR is looking for a design for a new remotely piloted vehicle that can deliver ordnance to a target over the horizon. To accomplish their goal, NAVAIR will contract with two firms to produce a vehicle design.

NAVAIR spells out some of the basic requirements such as range, maximum altitude, targeting system, etc. The competing firms are each given \$1.5 million to come up with a design. The deliverables are a design, a mock-up and a report with executive summary.

NAVAIR hopes to use the best design as the basis for the new vehicle. The incentive for the contractors to put forth their best effort is a) the hope of a follow on contract for production of the vehicles and b) they are in competition. Past performance was heavily weighted in the source selection process.

If neither of the designs proves cost effective or not feasible for other reasons, NAVAIR will pay both contractors the full promised amount and shelve the reports.

EXAMPLE 2

CONTRACT FOR USS INCHON (MCS-12) PIERSIDE RESTRICTED AVAILABILITY (PRAV)

Scenario:

The USS INCHON (MCS-12) is an older ship in need of repair. Several other ships have run aground earlier in the year and the Surface Forces Atlantic (SURFLANT) repair budget has been greatly diminished to meet these unexpected expenses. The USS INCHON has a long list of items that need attention but some are more critical than others. INCHON Engineering Department personnel and the ship's Port Engineer have prioritized the work that needs to be done.

SURFLANT is able to scrape together \$700,000 for repairs. They contract with Generic Shipyard, Inc. to fix as many items on the list as possible beginning with the highest priority items. SURFLANT and the ship will be satisfied with whatever can be repaired given the funds available.

EXAMPLE 3

CONSULTANT SERVICES

Scenario:

You are the contracting officer for a major weapon system procurement. You know extensive market research is required but you have realized your command does not have the available manpower to conduct market research for your program and continue with other business. You decide to hire consultants to provide the information you require.

As this is a shaping up to be a \$3B procurement, you know the value of good market research is key to the success of the acquisition. You contract with two different consulting firms to collect, organize and present the data. Each firm will receive \$300,000 for their efforts regardless of the quality of product delivered. Past performance was heavily weighted in the source selection process.

You may decide to use only one report, you may use both, or you may use neither and be required to hire a third, different firm. Regardless of what you decide, the consulting firms will receive full payment. Their incentives are a) the hope for additional consulting work, b) competition.

APPENDIX E. COMPARISON OF CONTRACT TYPES

	FFP	FP LOE	CR	T&M	FPVO
Price Variability	Price not subject to adjustment	Payment based upon contractor effort	Government pays all allowable costs - price ceiling exists Final cost is variable	Cost based upon DLH, fixed wages, etc. Materials at cost Final cost is variable	Price not subject to adjustment
Risk Assignment	Maximum risk on contractor	Government assumes all risk	Government assumes majority or risk	Government assumes majority of risk	Government assumes high risk due to loss of control over final outcome
Outcomes	Must deliver	Best Effort within specified LOE	Best Effort	Best Effort	Best Effort Full payment regardless of outcome
Administrative Burden	Minimum	Moderate	Significant	Significant	Potentially high
Commercial Item Applicability	Applicable for procurement of commercial items	Applicable for procurement of commercial items	Prohibited for procurement of commercial items	Applicable for procurement of commercial items	Applicable for commercial and non-commercial
D&F Required?	None	None	None	D&F required to state no other contract type suitable	None
Applicability	Reasonably defined or with detailed specifications	Work not clearly defined such as R&D	Costs cannot be estimated with sufficient accuracy to use fixed-price	Not possible at time of K to estimate accurately extent or duration of work	Clearly defined range of plausible, acceptable outcomes exists
Limitations	Requirement must be highly defined Not for R&D	Contract price must be less than \$100,000 Not for anything but R&D	Requires CAS compliant accounting system and significant Government oversight	Requires significant Government oversight	Requires monitoring
Incentives	Contractor has incentive to control costs	None	Contractor incentive to stay below ceiling	None	Contractor has incentive control costs

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APPENDIX F. FAR REVISION FOR FPVO

16.208 Fixed-Price, Variable Outcome contract. (No Text)

16.208-1 Description.

A Fixed-Price, Variable Outcome (FPVO) contract provides for a price that is not subject to any adjustment on the basis of the contractor's cost experience in performing the contract. This contract type allows for a range of possible outcomes rather than one definitive outcome. The possible acceptable outcomes must be determined prior to award. This contract type places on the contractor maximum risk and full responsibility for all costs and resulting profit or loss. It provides maximum incentive for the contractor to control costs and perform effectively.

16.208-2 Application.

The FPVO contract is suitable for acquiring commercial goods and services, Research and Development and other high-risk acquisitions when the need is not clearly defined and—

- (a) The dollar value of the acquisition cannot be exceeded;
- (b) It is known or suspected the cost of all repairs will exceed the funds allocated;
- (c) There is a clearly defined range of acceptable outcomes;
- (d) There is adequate price competition;
- (e) There are reasonable price comparisons;
- (f) Available cost or pricing information permits realistic estimates of probable costs of performance; and
- (g) The contractor agrees to accept the performance risk associated with a Fixed-Price type contract.

16.208-3 Limitations.

The FPVO shall not be used when there is only one desired and acceptable outcome. It shall not be used when scope growth and commensurate funding increases are anticipated.

APPENDIX G. FAR REVISION FOR FP LOE MD

16.208 Fixed-price, level-of-effort Milestone Decision contract. (No Text)

16.208-1 Description.

A fixed-Price, level-of-effort Milestone Decision requires-

(a) The contractor to provide a specified level of effort, over a stated period of time, on work that can be stated only in general terms; and

(b) The Government to pay the contractor based upon effort expended and attainment of milestone events.

16.208-2 Application.

A firm-fixed-price, level-of-effort milestone decision term contract is suitable for specific research and development efforts. The outcome(s) is(are) to be logically broken down into milestone events. The objective of the contractor is to meet the criteria of the milestones.

The Government is to work with the contractor(s) to establish the milestones. Each milestone provides the Government an opportunity to review the progress of the effort and gauge the degree of future success. At each milestone review, the Government has the opportunity to continue or suspend further funding. The Government and contractor(s) are to conduct milestone reviews and discuss performance, cost and schedule trade-offs prior to continuance.

Payment is based upon level of effort and milestone accomplishment. Each milestone will have a fixed-price associated with it; actual payment may be less than the fixed-price based upon contractor effort but may not exceed the fixed-price.

16.208-3 Limitations.

This contract type may be used only when-

- (a) The work required cannot be otherwise clearly defined;
- (b) The required level of effort is identified and can be agreed upon in advance;
- (c) The project can be broken down into logical milestone events; and
- (d) The contract price is \$1,000,000 or less.

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